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NOTES ON SOME TERRESTRIAL ORCHIDS OF THE LONDIANI DISTRICT

By R. MORAY GRAHAM

In Kenya few of our smaller flowering plants have common or 'trivial' names, and their official titles are often cumbersome. Furthermore, the botanists, those deceptively serious-looking people responsible for naming plants, have a flippant habit, which they call a system, of changing these names pretty frequently. The writing of a superficial little note like this is then made difficult. A resounding title like *Pteroglossaspis ruwenzoriensis* should really be reserved for a meeting of the Royal Society or for an International Botanical Congress; but in the absence of any other generally accepted name that is the only way in which we can refer to a humble little plant.

During a period of about 15 years I collected specimens of any ground orchids I happened to see in flower in the Londiani district, and had them provisionally identified. Although I never went out deliberately to look for orchids I seem to have met some 30 different species within a radius of about 25 miles from Londiani. Naturally enough, those most commonly noted grew in the open grasslands; but I believe that these were also by far the commonest in actual numbers. Some species preferred the partial shade of the fringe of bush or forest bordering the glades, while a few grew in full shade in the forest itself. Many chose soil which was waterlogged for some months of the year—when they flowered—but which was baked hard at other times. One species was found growing in soil which was waterlogged perpetually.

Many glades near Londiani are of the 'vlei' type—a few inches of leached, whitish soil overlying a thick bank of murram which is almost impervious to water. These vleis support a dense growth of coarse, tufty grasses and many orchids. Commonly some 30 inches of rain fall between the 1st April and the 15th September, with only about 13 inches spread over the rest of the year. Vleis are annually waterlogged from about May till mid-September. Orchids flower as a rule in June and July. I am not sure what causes a good orchid year in the vleis. The amount and distribution of rainfall is a dominating factor of course; but it is likely that the density of the grass cover at different times of the year is also of the greatest significance. This in turn depends partly on the date and the intensity of the last grass-fire, and partly on the incidence of grazing by cattle.

Grass-fires, if uncontrolled, normally occur in the middle or at the end of the dry season. If the grass has been protected against fire for a season or two, and then dries out thoroughly before being burnt, a very hot fire results and the soil is almost wholly exposed. Most of the existing orchid corms in the area will then probably have a chance to put out strong flowering spikes when the rains break, and much of the seed which is set will reach mineral soil and germinate. However, if the new crop of grass following the burn is immediately grazed over very heavily, few orchids will actually be allowed to flower, although the corm will survive and will be able to make another attempt in the following season. When matted carpets of unburnt and ungrazed grasses accumulate for a few years, it seems that many corms are unable to push their flower spikes through at the onset of the rains and cannot flower and set seed to replenish the stock of corms in the ground.

It is easy to find flower spikes in bud and dig up plants with an undisturbed cube of earth six or eight inches in thickness. Such plants may be put out in a garden and they will flower perfectly normally. At one time or another I moved a hundred

or more of half a dozen different species from the vleis into what appeared to be very similar soil in the garden of the forest station at Londiani. To the best of my knowledge, none of these attempted to flower again in the following season. I am sure that in their natural, undisturbed state, many corms do not flower regularly every year, and it seems likely that in order to allow a rootstock to prepare an embryonic flowering shoot for the next season, conditions must be exactly right. Is the new flower embryo developed immediately after the plant has seeded, before the leaves wilt? Or is this done when the corm is apparently dormant during the long, dry spell, accompanied by grass-fires?

On some rocky hilltops near Londiani a species of 'fan-lily' (*Boöphone*) which looks not unlike a coarse *Haemanthus*, is common. The large bulbs grow in very shallow soil on flat rock outcrops. They are almost wholly exposed to the sun, except for the actual roots. I transferred about 50 of these to my garden, but although they flourished they would not flower. After about three years I reluctantly decided that kindness was wasted on them. I covered them in the height of the dry season to a depth of several inches with chopped, dry grass which I then burnt. Most of the half-baked, and no doubt surprised, bulbs responded by producing flowers as soon as the rains came.

The case of *Anoiganthus brevifolius* (Harv.) Bak. was somewhat similar. As a rule, we managed to protect from fire the fringe of shrubs growing under the *Acacia lehai* trees which commonly bound all grass glades in this part of the country. This is done by deliberately firing grass in the glades when it is still too green to burn freely. At this stage, early in the dry weather, the grass immediately adjoining the fringe is still so green that it will not burn at all. On one occasion a long unburnt fringe close to the garden of the Forest Station was accidentally fired just before the rains, and a very hot burn resulted. With the rains, scores of the delightful little *Anoiganthus*, not unlike a very bright yellow *Freezia*, came up in the burnt patches. In the following year I carefully burnt over the same area—a slow controlled fire to avoid further damage to the forest fringe. Only a few scattered *Anoiganthus* appeared. Next year, after another very gentle burn, there were none. Did the orchid corms, transferred to my garden not get a harsh enough 'winter'? Does a grass-fire, or exposure through heavy grazing of the soil in which they grow, stimulate flowering?

At least 40 species of ground orchids, belonging to eight or ten genera, could probably be found within 30 miles of Londiani, but of these only about a dozen species are particularly noticeable or attractive—except presumably to the specialist collector. Flowers are borne on upright, unbranched spikes, and in most cases each plant only produces a single spike in a season.

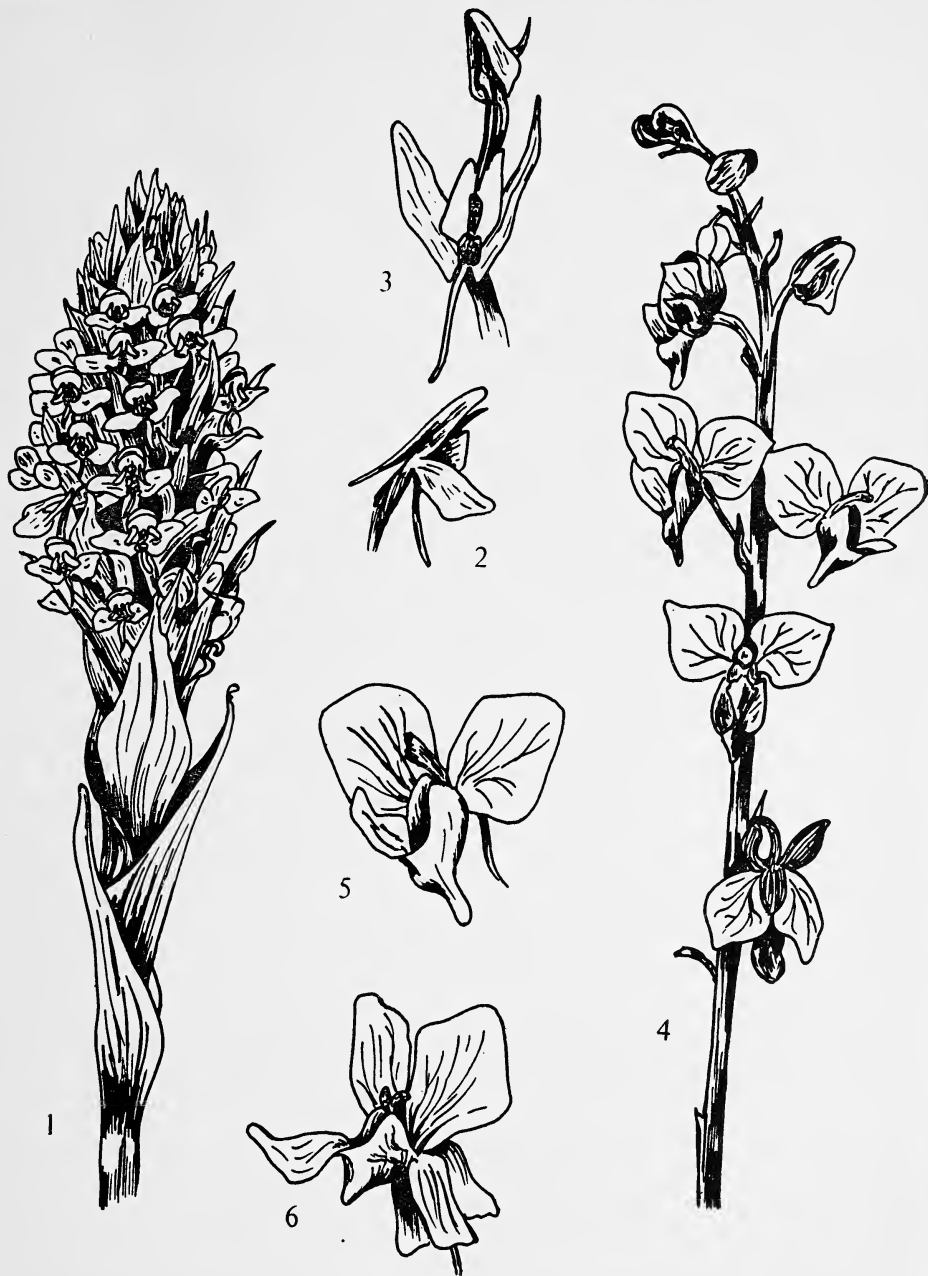
In the following notes, covering very briefly about 30 of the commoner or more interesting species, I have made no attempt to describe plants in such a way as to enable them to be identified in the field. I have merely indicated roughly the types which the casual sightseer might be expected to find during the rains in a normal year. Collectors could doubtless locate many less conspicuous species not mentioned here.

For those who are interested, the botanist in charge at the East African Herbarium, P.O. Box 5166, Nairobi, situated immediately behind the Coryndon Museum, will always be pleased to identify any specimens sent in. Or visitors may ask for permission to see dried specimens or sketches, where these exist, of orchids in the Herbarium itself.

Genus *Disa*

Disa erubescens Rendle. Perhaps the most striking plant of those under review. In some years it was common in vlei land at Londiani. Spikes up to 3 ft. in height normally bear half a dozen flowers. I have counted as many as 13 fully open and perfect blooms on

PLATE I



1. *Disa schimperi*, inflorescence
2. *Disa schimperi*, flower
3. *Disa erubescens*, flower

4. *Eulophia orthoplectra*, inflorescence
5. *Eulophia orthoplectra*, flower
6. *Eulophia paivæana*, flower

one stem. Individual flowers are about one inch in diameter. The colour is usually a vivid orange with scarlet markings, but occasionally plants bearing clear yellow flowers may be found.

Disa ochrostachya Rchb.f. This is another good plant, but in Londiani at least it is very rare. I have heard that it is commoner near Kericho. I found one plant at Londiani in vlei, and one in red soil in grassland in the Lembus Forest Reserve. The spike, 2 ft. or more in height, bears numerous, close-packed flowers, bright canary-yellow in colour, speckled with brownish markings.

Disa schimperi N.E.Br. Spikes up to 2 ft. 6 ins. in height found in vlei. Close packed flowers are bright mauve with darker purple markings.

Disa oculans Schltr. Very similar to the last. Spikes up to 2 ft., found in grassland. Flowers bright mauve-pink.

Disa deckenii Rchb.f. Similar again, but found usually at altitudes over 8,500 ft.

Disa concinna N.E.Br. A vlei species to 18 ins. The close-packed flowers, pale and dark purple, are not showy.

Disa amblypetala Schltr. Another high-altitude (8,000 ft. or more) type. Spikes to 2 ft., flowers purple and green but not showy.

Genus *Eulophia*

Not so very long ago many East African orchids were assigned to the genus *Lissochilus*, but I understand that all of these have, for the moment at least, been transferred to *Eulophia*. There is one morsel of comfort in this, *Lissochilus* may be pronounced in several different ways, and I have tried them all! Botanists of my acquaintance have always been in favour of a pronunciation other than the one in current use by me.

As it happens, although some of the most spectacular ground orchids in East Africa belong to this genus, the Londiani representatives are, with one exception, rather insignificant.

Eulophia orthoplectra (Rchb. f.) Summerh., previously known as *E. bella*, is a charming plant. The spikes stand about 3 ft. high and are found in grassland from Kedowa to Fort Ternan and beyond. Individual flowers may be an inch and a half or more in diameter. The outsides of the larger petals are a very bright yellow. The insides are closely striped with a rich Indian red or crimson. Flowers glisten as though they have been dipped in a thin varnish.

Eulophia paivaeana (Rchb. f.) Summerh. subspecies *borealis* Summerh. This ponderous title seems to be necessary for a plant which is one of the very few local ground orchids to retain leaves permanently. Several flowering spikes, up to 5 ft. in height, may be borne simultaneously by one plant. Deeply veined leaves, resembling the ornamental 'pampas-grass', are several feet long. Flowers are yellow with dull purplish streaks and blotches, and are not striking. Found in bush near Kedowa.

Eulophia sp. near *E. crinata* Rolfe. A Kedowa grass-land species. Six or eight half-open drooping flowers, pale mauve and green and about one inch long, are borne on a stem about 15 ins. in height.

Eulophia pyrophila (Rchb.f.) Summerh. Another small species, found in bush, with a 12-inch stem bearing a few striped, dull purplish-brown flowers each half an inch or less in diameter.

Genus *Brachycorythis*

Brachycorythis pubescens Harvey. This locally uncommon little plant is worth noting as the mauve coloured flowers have a scent resembling that of heliotrope (cherry-pie). It is found in grasslands and stands some 18 ins. in height.

Genus *Pteroglossaspis*

Pteroglossaspis ruwenzoriensis Rolfe. In spite of its rather awe-inspiring title, this common little vlei orchid is rather attractive when examined. The flowers are white with a maroon or dark purple mark in the throat, eight or ten of them grow in a very tight little corkscrew whorl at the top of the flowering spike giving the plant a characteristic appearance. Spikes may be 2 ft. or more in height.

Genus *Habenaria*

This genus is undergoing critical revision at Kew which, I fear, may mean that the majority of specific names mentioned here will be out of commission by the end of the year! On present indications up to a dozen species of the genus occur

PLATE II



1. *Satyrium speciosum*, inflorescence.
2. *Satyrium speciosum*, flower.
3. *Satyrium fimbriatum*, flower.

4. *Habenaria filicornis*, inflorescence.
5. *Habenaria keniensis*, flower.

near Londiani. Flowers of all are green, yellowish-green, or white and green. But although they lack colour, many of them are of interest because of their odd shapes, due to narrow, pointed petals and long spurs.

Habenaria lykipiensis Rolfe. This is perhaps the commonest species in the Londiani vleis. It grows to a height of a couple of feet and has loose heads of up to 20 delicate, spidery flowers with $\frac{3}{4}$ -in. spurs, borne on pedicels which come away at right angles from the stem.

Londiani is cold during the rains and one usually lights a fire every evening. By 1932 the old Forest Station had already been on the condemned list for about 15 years, as it had been badly built to a shocking design, but in the best Government tradition it remained in use until 1952. In the minute sitting-room, once the fire had been lit one could sit in a smoky fug with the windows shut, or in a smoky cold gale with the windows open. One afternoon we brought a bunch of ground orchids into this room and in due course the fire was lit and the usual evening fug developed. It so happened that we had just taken over a puppy. After a while, although we could find no direct evidence of misconduct, we reckoned that it would not be unreasonable to banish the animal to a store, where he howled miserably. Soon the smell became worse; but a careful search of the whole house failed to implicate the dog, the cat or any other animal. Eventually, of course, the mischief was traced to *H. lykipiensis*. The flowers were cast out and the puppy was returned to the hearth, where he was sick at once; but all else was well. The scent is not noticeable in a fresh-cut flower, but it brews up in a warm fug. The plant could be described as a natural for the practical joker.

Habenaria cavatibractea Summerh. Found in grassland, growing to height of about 2 ft. The flowers are remarkable for spurs which may be 4 ins. long. A single plant, possibly of this species, found growing in forest in Kedowa was about 6 ins. tall with crab-like flowers 2 ins. in diameter carrying spurs over 5 ins. long. It was labelled at the time, *Habenaria* species near *decorata* Hochst.

Habenaria filicornis Lindley. Found in vlei, to a height of 2 ft. Flowers resemble those of *H. lykipiensis* but are only half the size and are practically sessile.

Habenaria petitiiana Dur. & Schinz. A very dull little plant in bush or grass, bearing yellowish green flowers, scarcely one eighth of an inch in diameter, close to the stem which may be 18 ins. high.

Habenaria peristyloides A. Rich. This, growing to a height of about 2 ft. in damp grasslands, has yellowish-green flowers which are not unpleasantly scented. The flowers are not spider-like but are close packed on the stem. Usually found at 8,000 ft. or over.

Habenaria cornuta Lindley. This grassland species has odd-looking green flowers which, when mature, bear a pair of upright horn-like appendages about $1\frac{1}{2}$ ins. long. Longish pedicels take off upwards from the stem at an angle of about 45° .

Habenaria keniensis Summerh. Similar and prefers scrub. Flowers about twice the size of those of *H. lykipiensis*.

Habenaria genuflexa, *H. keiliana*, *H. praestans*, *H. schimperiana*, *H. ruwenzoriensis* and *H. rendlei* are names which have been given to other specimens sent in. They are probably synonyms of others mentioned above. All are green-flowered, grassland types.

Genus *Satyrium*

The last genus worth noting here is *Satyrium* which boasts of several species.

Satyrium coriophoroides A. Rich and *S. schimperi* Hochst. These may be synonymous. They are very dull, grass or vlei species with two-foot spikes of close packed green flowers. The lower pair of leaves are usually roundish, coming off the stem at right angles at ground level.

Satyrium sacculatum (Rendle) Rolfe. A common vlei or grassland species. Flowers are orange red or a bright clear scarlet, fairly close-packed on spikes up to $2\frac{1}{2}$ ft. high.

Satyrium sceptrum Schltr. Very similar to the last but the flowers are less numerous, more lax, and often a dull or rather dirty orange. Wanderobo children are said to eat the corms.

Satyrium crassicaule Rendle. This occurs on permanently waterlogged semi-floating islands on Lake Narasha at Timboroa (9,000 ft.). It will grow in running water in upland swamps. The spikes of handsome, close-packed deep pink or purplish mauve flowers are 30 ins. high or more. An attractive plant, with a superficial resemblance to *Disa schimperi* or *D. occultans*.

Satyrium speciosum Rolfe. This is found commonly in damp depressions on rocky outcrops or in grass on the fringe of bush. It is a pretty little plant standing about 9 ins. to 12 ins. high as a rule. At a little distance the clear, bright pink flowers resemble a hyacinth spike.

Satyrium fimbriatum Summerh. This occurs in grasslands usually at altitudes over 8,500 ft. and is somewhat similar to the last. The colour is generally more of a rosy-red and the petals have distinctly frilled margins. The whole effect is still hyacinth-like, but this is a more attractive and delicate-looking plant than the last.

THE GREAT HERONRY OF GARSEN ON THE RIVER TANA

By MYLES E. W. NORTH

Near Garsen—the place where the Malindi-Lamu road crosses the River Tana—there is a great open plain east of the river which is flooded annually for several months during the long rains from early May onwards, and somewhat higher country on the west of the river which is flooded only in parts. About a couple of miles below Garsen on this west bank there is a lagoon called Isowe, or Kubi Balle, which gets filled at the height of each May flood and is then sealed off, so the water dries slowly and lasts for several months—well into September, I think. The lagoon is elongated, with open water at the lower end near the river, but the upper portion is filled by a thicket of henna trees (*Lawsonia inermis*) which grow in the water.

This thicket is used during the months of flood (May to September) as a breeding colony by numerous water birds. As such it must be one of the finest in the country, fully comparable to the great colony at Kisumu described by Jackson in his *Birds of Kenya and Uganda*, and destroyed many years ago in the course of anti-malarial operations. The birds breeding at Isowe make use of the wonderful feeding grounds of the flooded areas east of the river.

On the 20th-21st August 1956 I visited the colony with General Sir Gerald Lathbury and his A.D.C., Captain Simmons, and with Commander R. M. Jenkins, the D.C. Tana River. We found 13 species breeding here: Darter, Grey Heron, Purple Heron, Great White Egret, Yellow-billed Egret, Black Heron, Little Egret, Squacco Heron, Night Heron, Open-Bill Stork, Sacred Ibis, Glossy Ibis and African Spoonbill. A fourteenth—the Buff-backed Heron—was suspected but not proved.

The local people told us that this site is used every long rains. Long ago Major T. H. E. Jackson notified me of the existence of this colony, which he had visited in July 1940 and had then found a number of species breeding which sounded very similar to what we found in 1956.

From the visitor's point of view the virtue of this swamp is that it can be visited during the long rains at any time when the Malindi-Garsen road happens to be open, and in fact it is only a mile from the road at a point some five miles short of Garsen (Wanjila Hill and camp site). The point to strike off from the road is at a telegraph pole numbered 1312; here follow a well-marked cattle track which is quite suitable for a Land Rover provided that the ground is reasonably dry. The track leads to the upper end of the lagoon, from either side of which one can obtain excellent views of the birds. May and June would, I think, be particularly suitable months for a visit. The time of our visit—August—was rather late, especially for the smaller species, many of which had finished nesting by then. More observations are badly needed. It is, however, important that any observations should be done with discretion and with the minimum interference to the birds.

List of breeding birds

These were as seen on the 20th-21st August 1956. In each case I have made a guess of the number of breeding pairs present, based on my impression of the number of occupied nests or fledged young to be seen there—but it should be emphasised that these are merely impressions and are not based on any form of count, for which there was no time. No mention is made of non-breeding birds here, since these, too, would have needed more time.

- DARTER. *Anhinga rufa*. 50 pairs? Several birds seen incubating in a dead tree.
- GREY HERON. *Ardea cinerea*. Under 30 pairs? Two nearly-fledged young seen.
- PURPLE HERON. *Pyrroherodia purpurea*. 100 pairs? Many fledged young clambering about.
- GREAT WHITE EGRET. *Casmerodius albus*. Several hundred pairs? Young mostly fledged, but some still in down.
- YELLOW-BILLED EGRET. *Mesophoyx intermedius*. Several hundred pairs? Young of various stages.
- BLACK HERON. *Melanophoyx ardesiaca*. 50 pairs? Large fledged young wandering about.
- LITTLE EGRET. *Egretta garzetta*. 200 pairs? Young seen.
- BUFF-BACKED HERON. *Bubulcus ibis*. A bird in full breeding plumage seen, but no proof of actual breeding.
- SQUACCO HERON. *Ardeola ralloides*. 100 pairs? Many streaky juveniles wandering about.
- NIGHT HERON. *Nycticorax nycticorax*. A few hundred pairs? Many spotty juveniles walking or flying about.
- OPEN-BILL STORK. *Anastomus lamelligerus*. A few hundred pairs? Nests were scattered over a considerable area and mainly had young.
- SACRED IBIS. *Threskiornis aethiopicus*. 50 pairs? Nests had downy young, for the most part.
- GLOSSY IBIS. *Plegadis falcinellus*. Five pairs? One nest certainly occupied; perhaps two.
- AFRICAN SPOONBILL. *Platalea alba*. 50 pairs? Young at various stages.
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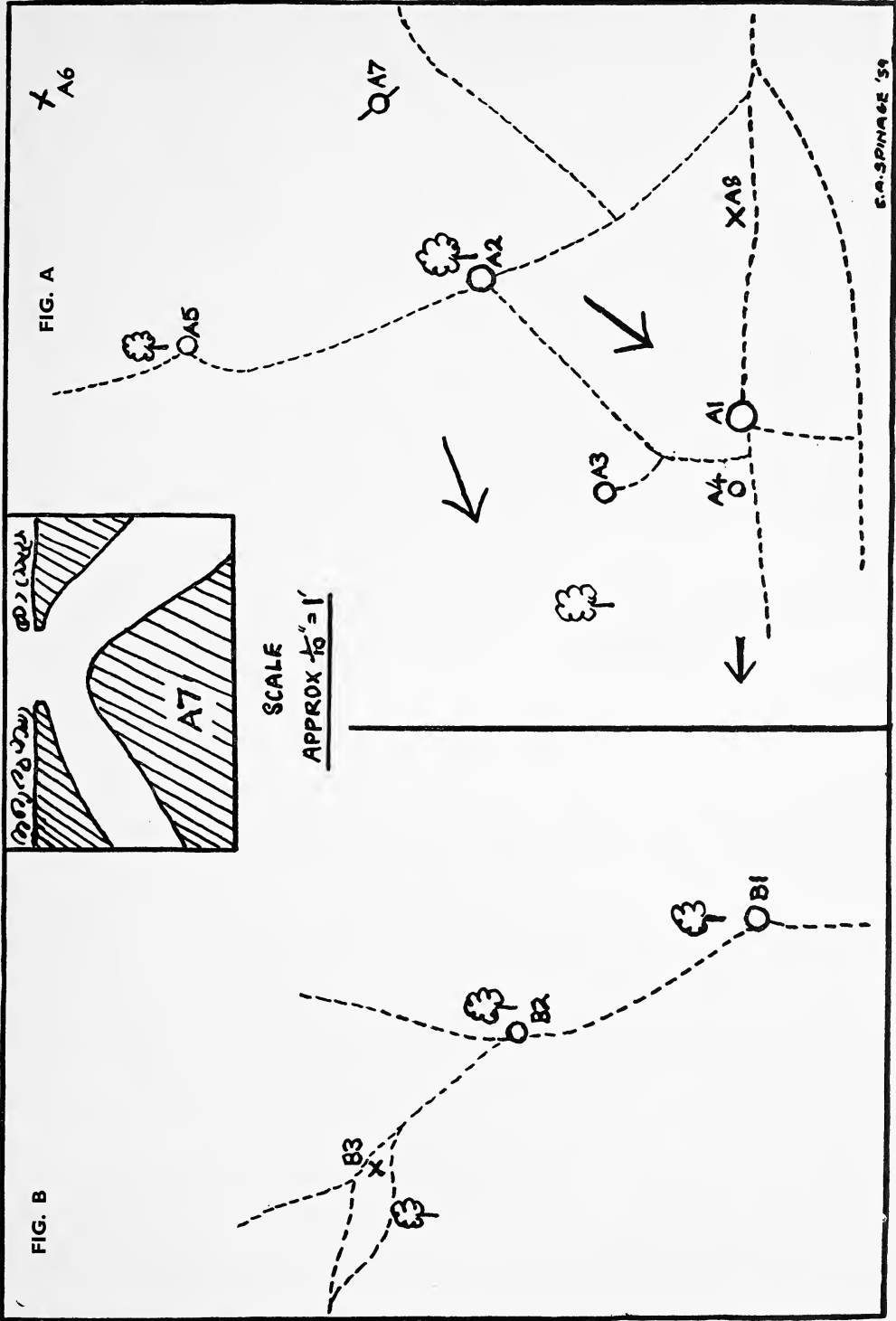
NOTES ON THE EAST AFRICAN PORCUPINE

(*Hystrix galeata*)

By C. A. SPINAGE, F.Z.S.

The Common Porcupine is generally referred to as adapting an old ant-bear hole or something similar for its home. In the writer's experience, however, they are extremely careful and painstaking home-builders, the sites often being carefully chosen on a well-drained slope. My observations have all been confined to burrows in exotic eucalyptus woodland which they seem to favour. The holes are often excavated very deeply, as can be seen from the amount of earth thrown up which may run into several hundredweights in some cases.

A simple burrow seems to consist merely of two entrances, but in places where the animal is considerably persecuted by Africans periodically attempting to suffocate it by smoking, the burrow may be extremely complex, having as many as five separate entrance holes. The one depicted in Fig. A also had a hole that was quite well concealed in the undergrowth (inset) and without any tracks going near to it. This may have been an air hole or perhaps the ground had merely caved in when the tunnel was being excavated.



Holes tunnelled in flat ground are often dug out again after heavy rain.

In parts of South Africa the porcupine appears to have cave-like lairs in which it makes bone collections: I have only on one occasion found a piece of bone near a hole that I have examined. Whether this habit is due to calcium deficiency or whether the bones are merely tooth-sharpeners is not yet known. I placed some calcium carbonate outside a porcupine's hole to see if it attracted the occupant, but it appeared not to take any notice of it, the calcium being scattered by its walking through it.

The porcupine does not appear to be such a wholly nocturnal animal as is generally supposed: I have come across one sitting in the undergrowth in the afternoon in a quiet patch of forest, and in the same area one morning a friend's dog flushed one. Yet another observer reports seeing one walking about in the afternoon in the Mathews Range of the Northern Frontier District. This is, however, the exception rather than the rule, as from my observations I have found that they do not stir from their burrows until about nine to half-past at night. Perhaps the parents sometimes stay outside during the day when they have young inside, a habit that is common with the Bat-eared Fox.

The quill tips are smooth, unlike those of its American counterpart which are saw-edged, and once stuck into an animal's flesh gradually work themselves deeper and deeper with each successive contraction of the muscle.

The extent and complexity of some of the burrows can best be seen by reference to the accompanying sketches and the following descriptions. The dotted lines are the animal's main tracks, trees in close proximity only are shown.

Fig. A.

A1 and A2 are the main holes, A2 being 17 feet from A1 and about seven feet higher up. A3 is a small, freshly excavated hole, A4 is a small one that has been stopped up by Africans. A5 is a hole that had been stopped up by Africans and freshly opened by the porcupine. A6 is a stopped-up one, and A7 is the air-hole, or cave-in, already referred to, the inset shows the passage of the tunnel which was some four feet wide and two feet deep. The holes generally were about two feet wide and one and a half feet deep. A8 is also a stopped-up hole. As can be seen, the distance between the holes is considerable, and must have involved a great deal of excavation. The arrow at the extreme left points to a further series of smaller holes which are probably those of a Giant Rat. The other large arrows indicate the slope of the ground.

Fig. B.

This shows a simple burrow of two entrances in an undisturbed area on flat ground. B3 is a defæcating spot.

Fig. C.

C1 is the main hole. C2 was not in use, as could be seen from the cobwebs and detritus in front of it. C3 is another hole not in use, 35 feet from C2. There is no indication that this is part of the same burrow, however, except that there are no other holes near to it. C5 likewise is a small hole not in use, 39 feet from C1. C4 was not in use. The shaded areas represent the earth thrown up, in this case there must have been nearly a ton exposed.

Fig. D.

This shows an old burrow that did not appear to be in use, it was situated about 43 yards from C.

FIG. C

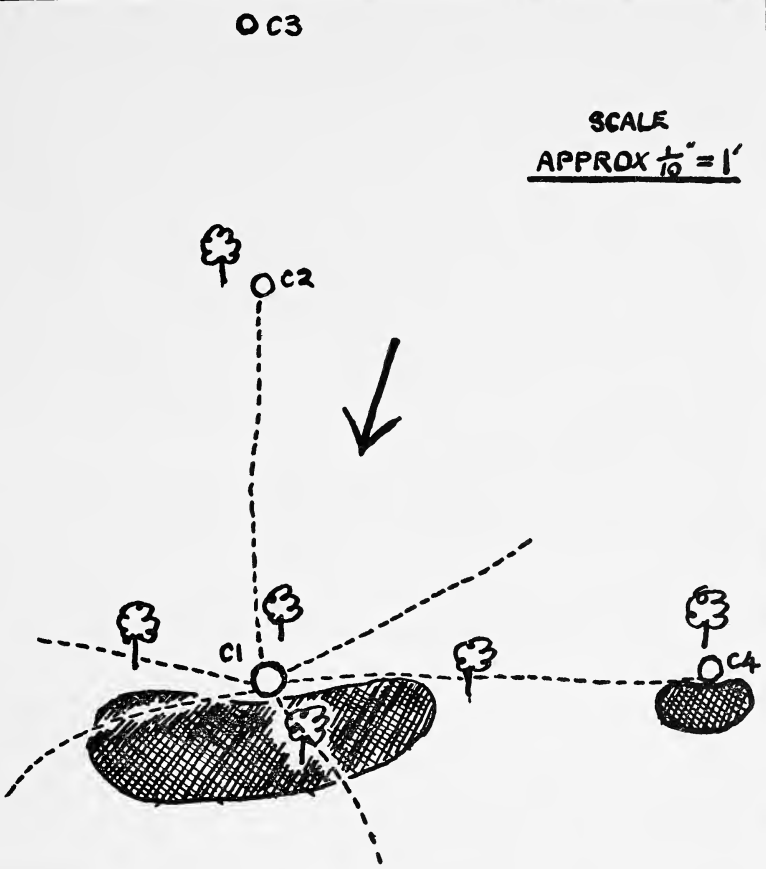
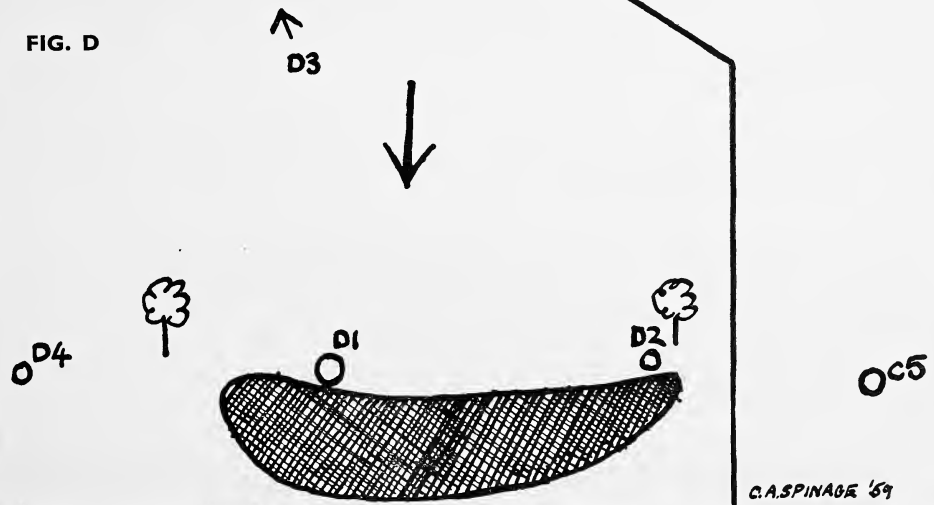


FIG. D



C.A. SPINAOR '59

SOME MAKUENI BIRDS

By BASIL PARSONS

A few notes on the birds of Makueni, a very rich area less than 90 miles from Nairobi, may be of interest.

Most of this country is orchard bush in which species of *Acacia*, *Commiphora*, and *Combretum* predominate, with here and there dense thickets, especially on hillsides. Despite Kamba settlement there is still a wealth of bird life. The average height above sea level is about 3,500 feet, and the 'boma' where we live is at 4,000 feet. To the west and south-west are fine hills with some rocky precipices, the most notable being Nzani.

Much of my bird-watching has been done from a small hide in the garden situated about six feet from the bird-bath, which is near a piece of uncleared bush, and in this way I have been able to see over 60 species at really close range, many of them of great beauty.

Birds of prey are very numerous. The Martial Eagle rests nearby and is sometimes seen passing over. The small Gabar Goshawk raids our Weaver colony when the young are fledging, I have seen both normal and melanistic forms. The Black-shouldered Kite is often seen hovering over the hill slopes, and the cry of the Lizard Buzzard is another familiar sound. Occasionally I have seen the delightful Pigmy Falcon near the house.

Grant's Crested and Scaly Francolins both rouse us in the early morning. On one occasion a pair of the former walked within three feet of my hide. Harlequin Quail are at times attracted into houses at night. A Helmeted Guineafowl once hatched 14 out of 16 eggs from a nest in the bush just below the house.

Doves are numerous, and frequent visitors to the bird-bath. The beautiful Emerald-spotted Wood Dove with its prolonged call, gives us one of the most characteristic Makueni sounds. It seems to have wonderful powers of acceleration when flying up from the bird-bath.

Cuckoos are well represented; the Red-chested, the Emerald, Black and white and Black Cuckoos are all to be heard. The White-browed Coucal is another familiar early morning performer.

White-bellied Go-away Birds are often seen in small parties and they come up close to the house when the fruit on the trees is ripe. They and various species of hornbill are seen everywhere. The Ground Hornbill's booming is sometimes heard before dawn. Parties of Crowned Hornbills often come near the house, and they are very clever at hawking for large grasshoppers. I have also seen one having a struggle to remove a full-grown larva of *Bunæa alcinoe* (Emperor Moth) from its food plant. A Red-billed Hornbill nested once not far from the house, but the female broke out of the hole while still flightless, and was killed by a predator after the male had fed her for several days.

The Black-throated Honey-guide is another characteristic bird and a frequent visitor to the bird-bath, where it drives away other birds. I have twice seen it perform a display flight, producing an extremely loud rushing noise, almost a snorting. It appears to parasitise the Spotted-flanked Barbet—our commonest species—as I have seen this bird driving a Honey-guide from its nest hole.

The Red-fronted Tinker Bird is another very familiar member of the Makueni 'bird orchestra'. Unlike the Barbet I have not seen it come to drink. It makes a tiny nest-hole in a dead limb of a large *Commiphora* tree.

Woodpeckers are common, as might be expected. The only one I have been able to identify with certainty is the large Bearded Woodpecker.

Nightjars are often seen on roads, and one of the local varieties is the small rufous Donaldson-Smith's Nightjar.

Larks and Pipits are not very common, and we never see the beautiful Golden Pipit which can be found at Simba in more open country. The Flappet-Lark is the only Lark commonly to be seen with its unmistakable flight.

The Rufous Chatterer is a common visitor to the bird-bath in dry weather; small parties come and bathe until their feathers are completely soaked, after which they retire into a bush to preen.

The common Bulbul appears to be the White-eared (*Pyconotus dodsoni*). It is quick to detect and mob the snakes, in which it is joined by drongoes and other birds. The other common member of the Bulbul family, which is a very persistent singer, is the Zanzibar Sombre Greenbul, but I have never seen it drink or bathe.

Flycatchers are well represented—perhaps the most noticed is the Chin-spot Puff-back Flycatcher with its rather monotonous song. A pair roosted in a *Lannea* tree near the house, so low down that I was able to touch them without waking them up. Pallid, Spotted (on passage) and Black Flycatchers are also common. The Paradise Flycatcher has nested in a wait-a-bit tree near the house. Here the males are of the white form, and very beautiful. They do not alight at the bird-bath, but dash down from a twig and plunge into the water.

The Bare-eyed Thrush is a rather shy visitor which bathes early in the morning. I found one nest in the low fork of a *Commiphora* tree. Smaller members of the same family are among our best singers, as besides a Robin-Chat (? *C. semirufa*) we have the Spotted Morning Warbler; and, during migration, Nightingales sing freely. The Morning Warbler comes to bathe, but is very shy. Its song at a range of some ten feet is very powerful. It inhabits the dense shady thickets of *Acalypha* and *Acacia brevispica*. Two familiar friends among the 'foreign' birds are the Whitethroat and Willow Warbler, of which the latter sings freely. The most conspicuous resident Warbler is the large Moustache Warbler, which utters its cheery song from a bush or the top of a dead stem. Besides singing its phrase I have heard it making a kind of sub-song which included mimicry of other birds, e.g. the call of the White-crowned Shrike, Paradise Flycatcher, Bulbul and Sunbirds. It nests in long grass near the house. Another Warbler which weaves its beautiful nest in rough grass or low bush is the active little Tawny-flanked (*Prinia*). The Red-faced Crombec visits in small parties and hangs its nest, looking like a piece of spider's web, at the end of briars of *Acacia*.

Of the shrikes the Slate-coloured Boubou is often heard giving its 'duets' while the Brown-headed Bush-shrike is a noisy performer. The large Grey-headed Bush-shrike makes a mournful call. I have never seen any shrike either drink or bathe at the bird-bath. Parties of Helmet-shrikes sometimes pass through the bush near the house, looking rather like large butterflies.

Besides the White-breasted Tit, which is fairly common, the Penduline Tit comes to collect cotton-wool from bushes near the house, and I have seen three nests, all high up in wait-a-bit thorn trees (*Acacia mellifera*). This tiny bird has also come occasionally to roost in empty nests in the Weaver colony.

A pair of White-necked Ravens often frequent the hill and scavenge in the incinerators. When we first lived at Makueni it was very unusual to see a Pied Crow, but they are now common around markets, and have probably come here with the advance of 'civilisation'.

The most commonly seen starlings are the Superb, Hildebrandt's and the Blue-eared Glossy. The former seems to be associated with Sparrow Weavers, and it is very local in its movements—it can be seen a few hundred yards from the house, but never comes into the garden or to the bird-bath. Small parties of the delightful

Yellow White-eye also visit the bird-bath in the dry season, but we may go many months without seeing them.

The best place to see sunbirds is when one of the big *Erythrina* trees is in flower, usually in August or September. But we normally have the Scarlet-chested and Amethyst species around the house, where they are attracted to *aloes*, *salvia*, *ipomæa* and banana flowers. Female sunbirds seem much more addicted to drinking water or bathing than the males.

As might be expected in an area with such varied grassland, the family *Ploceidæ* is very well represented, and they are frequent visitors for bird-seed and water. Millet is also grown by the Makueni farmers, who have to spend a lot of time frightening flocks of queleas from their fields.

Both the Red-billed and White-headed Buffalo Weaver occur—the former usually nest in baobab trees and the latter in small colonies in *Balanites* or other thorny species, making barricades along the branches between the nest and the main trunk. The Sparrow Weaver's untidy nests are commonly seen, but, like the Superb Starling, this species never comes into our garden. Sparrows and Rock Sparrows seem rather scarce and shy.

Since 1954 we have had a colony of Layard's Black-headed Weaver (*P. nigriceps*) in a tree a few yards from the house. During the breeding season the birds rather monopolise the bird-bath, but they are a beautiful sight. The old males usually return about mid-August, nesting begins with the short rains in October, and birds are in the colony right through until the end of the long rains in May. *Panicum maximum* (Buffalo Grass) and *Acacia brevispica* leaves form the principal nest materials, lined with a few grass heads and ducks' feathers by the female. It is common for the clutch of eggs to be three. Young males not in full breeding plumage are often to be seen in the colony.

Recently there has been a large roost of the Chestnut Weaver, along with queleas, in bush on the western slopes of Unoa Hill. The birds assembled elsewhere and made a noise, rather as starlings do in Britain, before going into the roost. The Black-necked Weaver is, by contrast, a very shy species which sometimes visits the bird-bath in pairs. Its beautifully-woven nest can be found in dense thickets.

The Red-headed Weaver nested very near the house some years ago (1951) and its groups of nests may be seen in a variety of places. Our male built seven nests in all, one of which was used by the female and one by himself. The nests were very low down and the birds extremely tame. There was certainly only one female, and on one occasion only one young bird fledged. The White-winged Widow-bird is the only species of the widow-bird which appears to be common in Makueni.

The Bronze Mannikin places its nest in lemon or thorny trees very close to the house, sometimes near a hornets' nest. The Grey-headed Silver-bill has occasionally visited the bird-bath, but usually only a pair. The Green-winged Pytilia (*P. melba*) is a resident and very regular in its habits. I have noticed that, like many other small seed-eating birds, it remains paired during the dry season. The African Fire-finch is fairly common, making a quite different call from the familiar Red-billed species. The Black-cheeked Waxbill is another species which keeps together in pairs—they are very fond of bathing. Just at dusk a pair often fly up into the Black-headed Weaver colony and roost in one of the empty nests—at times they are chased by the Weavers. Besides the Red-cheeked Cordon-Bleu, the Purple Grenadier is another beautiful visitor to the bird-bath, and has nested in the garden.

Indigo Birds are sometimes seen, and Whydah Birds are well represented, with Pin-tailed, Straw-tailed, Steel-blue and Paradise all to be seen.

The only common finch is the Yellow-rumped Seed-eater, which is a thirsty little bird, often visiting in small parties and nesting in nearby thickets.

These brief notes may give a slight idea of the wealth of bird-life in the 'bush'.

NOTES ON A COLLECTION OF FISHES FROM THE TANA RIVER BELOW GARISSA, KENYA

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Introduction

The Tana River drains the southern and eastern slopes of Mount Kenya and the eastern slopes of the Aberdares, and is the largest river in Kenya. The trout reaches, above 5,000 ft., have been examined in detail by van Someren (1952), and collections of fishes have been made in the middle reaches, chiefly by Copley. But from Garissa to the sea, a distance of about 150 miles, the river has received little attention; difficult and often impossible road communications have been largely responsible.

In October 1958 and February 1959 several localities between Garissa and Ngau were visited. The main river and floodwater pools were fished at Garissa, Hola, Garsen, Wema, Golbanti and Ngau, using a small handnet, a 10-ft. muslin seine, and a large 30-ft. seine of 1-in. mesh. On both occasions the river was low and juvenile fishes predominated.

From Garissa to the sea the river meanders across a broad, sandy floodplain where ox-bows, cut-offs and associated river forms are common. A thin belt of riverine forest and cultivated land flanks the river, and dense stands of *Phragmites* line the banks. In the floodwater pools (*ziwas*) *Pistia*, *Salvinia* and *Nymphaea* occasionally achieve a nearly 100 per cent cover. These pools contain a wealth of aquatic fauna and are the principal breeding grounds and nurseries for many species of river fish.

The present collection contains three genera and four species which have not previously been recorded from the Tana River. The systematic position of some of these is still in some doubt, and will be dealt with more fully elsewhere, but tentative identifications can be given here.

Notes on Specimens Collected

Protopterus amphibius. Fairly common in most floodwater pools and swamps near the Athi and Tana rivers. Trewavas (1954) records specimens also from the Ijara waterholes and the Eusso Nyiro basin to the north of the Tana River.

Mormyrus spp. A species of *Mormyrus* has been seen in the upper Tana and was reported but not seen at Garsen. *M. tenuirostris* Peters and *M. hildebrandti* Peters have been recorded from the Athi River (Boulenger 1909). The latter Boulenger tentatively synonymised with *M. kannume* Forsk. of Lake Victoria and the Nile, and the former apparently differs from *M. kannume* only in dorsal fin position. It is likely that further specimens will show that *M. kannume* is in fact present in both the Athi and the Tana rivers.

Gnathonemus sp. This genus has not previously been recorded from either the Athi or Tana rivers. A single adult and some juveniles, caught at Hola, Garsen, Wema and Golbanti, strongly resemble *G. macrolepidotus* Peters, a widespread species found in many of the eastern rivers of Africa. Worthington pointed to the close affinity between this species and *G. victoriae* Worthington of Lake Victoria, and recent work by Poll and Trewavas may show the two to be synonymous.

Petrocephalus catastoma. *P. degeni* Blgr. of Lake Victoria and *P. stuhlmanni* Blgr. of the Kingani and other eastern rivers, are now considered synonymous with *P. catastoma* of Lake Nyasa (Whitehead, awaiting publication). The Tana River *Petrocephalus* fall into the same group, but are considered a distinct sub-species owing to their higher number of dorsal rays.

Alestes affinis. This species has been caught in all localities between Garissa and Ngau. Copley (1941) records *A. nurse* Rüppell in the Athi, but it is more likely that these were *A. affinis*.

Labeo spp. *L. gregorii* occurs in the lower Athi and Tana rivers, apparently replacing *L. cylindricus* Peters, which is found in the middle reaches of both rivers. A single specimen from a floodwater pool near Garsen cannot be referred to either of the above species, but shows some affinities with *L. victorianus* Blgr. of Lake Victoria. More specimens are required.

Barbus spp. The large 'Mahseer' *Barbus* (with parallel striae on the exposed portion of the scales) so characteristic of the middle Athi and Tana, are entirely absent from the lower reaches, although they have been recorded as far down the Athi as the Lugards Falls area. Two of the smaller species of *Barbus* (with radiating striae on the scales) are common in the lower reaches of both rivers, *B. zanzibaricus* being more abundant than *B. taitensis*. These two species appear to replace a similar large- and small-scaled species pair in the upper reaches, *B. amphigramma* Blgr. and *B. cf. portali* Blgr., both of which also occur in the Lake Victoria basin (Whitehead 1959 a).

Engraulicypris sp. This genus has not previously been recorded from either the Athi or the Tana rivers. A single half-grown adult and two juveniles were caught in a floodwater pool at Garissa. The largest fish has seven short gillrakers (similar to *E. bottegi* Vincig. of Lake Rudolf), but 37 lateral line scales, as in *E. bredoi* Poll of Lake Albert and *E. minutus* Blgr. of Lake Tanganyika. More specimens are needed before this fish can be named with certainty.

Clarotes laticeps. A small specimen was caught in a floodwater pool near Garsen. Copley (*loc.cit.*) lists this fish as occurring in the Athi also, but none have been seen.

Eutropius near *E. depressirostris*. Very common in all parts of the Tana and Athi rivers up to about 2-3,000 ft. This genus replaces *Schilbe* to the east of the Kenya rift valley.

Physalia sp. Previously unknown in the Athi and Tana rivers. Specimens have now been caught at Hola, Wema and Garsen, at the edges of the river but not in floodwater pools. In appearance these fishes resemble the almost transparent *P. pellucida* Blgr. of the Nile. They differ in lacking serrae on the pectoral spines, as does also *P. somalensis* Vincig. from Somali-land, which however has more anal rays.

Clarias mossambicus. This almost ubiquitous species is common in all parts of the Athi and Tana rivers up to about 4,000 ft. It is possible that other species may be present.

Syndontis spp. Two species have been found in the Athi and Tana rivers. *S. zambesensis*, the larger of the two, is grey with small black spots on the back and flanks. The second species, as yet unnamed, is marbled in yellow, black and olive green. In size and coloration the two bear a most striking resemblance to the species pair in Lake Victoria, *S. victoriae* Blgr. (grey) and *S. afro-fischeri* Hilgend (marbled), but differ in numbers of mandibular teeth.

Tilapia spp. Fishes with three anal spines (*T. mossambica*) occur in both the Athi and Tana rivers, but four-spined fishes (*T. nigra*) have so far not been found in the lower Tana; they have however been recorded in the upper reaches. The distinction between *T. mossambica* and *T. nigra* lies solely in the numbers of anal spines and the associated increase in dorsal spines in 4-6 spine fishes. Present work has suggested that two forms or varieties, rather than species, are present in these rivers. Four-spined fishes have now been stocked in ponds at the Hola irrigation scheme and these will undoubtedly find their way into the main river.

Lebistes spp. These mosquito-eating fishes have now been widely distributed throughout the Coastal Province as an anti-malarial measure, and they are common in floodwater pools in the Golbanti area. Specimens have also been caught at Kibwezi, on the Athi River, but have not been found in the floodwater pools of the lower Athi. Indigenous cyprinodonts appear to be absent from both the Athi and the Tana.

Glossogobius giuris. Juveniles of this euryhaline species have been caught in floodwater pools as far up the Tana as Garissa, where they probably form permanent freshwater populations. Two other gobies occur in the lower 30 miles of the Athi River, *Awaous aeneofuscus* (Peters) and *Eleotris fusca* (Schneider), but they have not been found in the Tana above Golbanti.

Anguilla spp. Three freshwater eels occur in the Athi and Tana rivers, *A. mossambica*, *A. bicolor bicolor*, and *A. nebulosa labiata*, the latter being the more abundant (Whitehead 1959 b). A single elver of *A. mossambica* has been recorded from the lower Athi (van Someren & Whitehead 1959), but most indigenous river fishing traps are too coarse to retain small elvers and the local fishermen are entirely ignorant of their existence. Frost (1955) made a detailed study of the Tana river eels.*

Discussion

The freshwater fishes of Kenya fall into three distinct biogeographical groups. Those of the Rift Valley rivers and lakes, particularly Lake Rudolf, have strong 'nilotic' affinities, a large number of genera common to the Nile system being present.

*Observations on the biology of eels (*Anguilla* spp.) of Kenya Colony. *Colonial Office Fish. Pub.*, No. 6.

By contrast, the fish fauna of the Lake Victoria basin to the west of the Kenya rift is notable for the absence of many typically nilotic genera, of which *Polypterus*, *Lates*, *Hydrocyon*, *Mormyrops*, *Hyperopisus*, *Citharinus* and *Distichodus* may be cited as examples. The absence of such nilotics and the very high percentage of species endemic to Lake Victoria, seem to indicate a distinct faunal type, the Victorian (Greenwood 1956). Finally, the eastward-flowing rivers to the east of the Kenya rift (the Athi and Tana systems) also lack the typical nilotic genera, but are closely linked faunistically with the more southerly of the eastern rivers of Africa, the Rovuma, the lower Zambesi and to some extent also Lake Nyasa.

The absence of these nilotic genera from certain lake and river systems in Africa has probably arisen in several ways. In the case of Lake Victoria, Greenwood (1951) has shown that at least two genera (*Lates* and *Polypterus*) were present in that area during Miocene times. He suggests that severe desiccation eliminated the nilotic stock and that physical barriers such as the Murchison Falls have prevented subsequent re-entry. The eastern rivers on the other hand may perhaps have never contained nilotic fishes, the distribution of the latter having taken place at a time when the eastern watershed of Africa was separated from that of the west. This isolation has apparently persisted until the present day, although the presence of *Clarotes* and *Physalia* in the lower Tana argues that some interchange with perhaps the Lake Rudolf system must have taken place. *Eutropius*, the third Tana river genus which is absent from Lake Victoria but present in the Nile, may represent a relict of an ancient fauna which had colonised much of tropical Africa before the separation of the eastern watershed and the distribution of the nilotic stocks.

Excluding eels and the euryhaline gobies, the remaining 11 lower Tana genera are also found in both Lake Victoria and the Nile. In the upper eastern rivers the links with Lake Victoria are very close, representatives of three small siluroid genera being identical or closely allied (Whitehead 1958). The same is true also for *Gara* and three small *Barbus* species (*B. kersteni* Peters and the two previously mentioned), while the three mormyrid genera of the Tana are again close or identical to Lake Victoria species.

The similarities between the eastern river and the Lake Victoria fish fauna may have resulted from direct interchange of the kind suggested by Kent (1942) (river reversal due to the rise of the eastern rift arch). Alternatively the species common to both areas may represent part of a once widespread fauna which has now become separated by the eastern rift. Marlier (1953) concluded that many species of fish found in the upper Ruzizi River, some of which occur in the upper reaches of rivers affluent to Lake Victoria, were relicts of such a fauna which have now become isolated by geographical and ecological barriers.

It must be emphasised that speculation based purely on distributional grounds is often misleading when unsupported by biological data. Knowledge of the biology of the Tana River fishes is still rudimentary and much remains to be done before faunal relationships can be determined with certainty.

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TABLE I

A List of Fishes collected in the Tana River below Garissa

(* = not previously recorded from Tana river).

LEPIDOSYRENIDAE

Protopterus amphibius (Peters) (all localities)

MORMYRIDAE

Mormyrus sp. (reported only at Wema, February 1959).

**Gnathonemus* near *G. macrolepidotus* Peters. (Hola, Wema, Garsen and Ngau, October 1958 and February 1959.)

Petrocephalus catostoma (Günther) (Hola to Ngau, October 1958 and February 1959.)

CHARACIDAE

Alestes affinis Günther. (Garissa to Ngau, October 1958 and February 1959.)

CYPRINIDAE

Labeo gregorii Günther (all parts of river below Garissa)

**Labeo* sp. (Garsen, February 1959.)

**Barbus zanzibaricus* Peters (all parts below Garissa)

**Barbus taitensis* Günth. (all parts below Garissa)

**Engraulicypris* sp. (Garissa and Hola, October, 1958).

BAGRIDAE

Clarotes laticeps Rüppell (Garsen, October 1958).

SCHILBEIDAE

Eutropius near *E. depressirostris* (all parts below Garissa).

**Physalia* sp. (Hola, Wema and Garsen, October 1958 and Feb., 1959)

CLARIIDAE

Clarias mossambicus Peters (all parts below Garissa).

MOCHOCIDAE

Synodontis zambesensis Peters (all localities).

**Synodontis* sp. (all localities).

CYPRINODONTIDAE

Lebistes sp. (introduced: floodpool at Ngau)

CICHLIDAE

Tilapia mossambica Peters (all localities)

GOBIIDAE

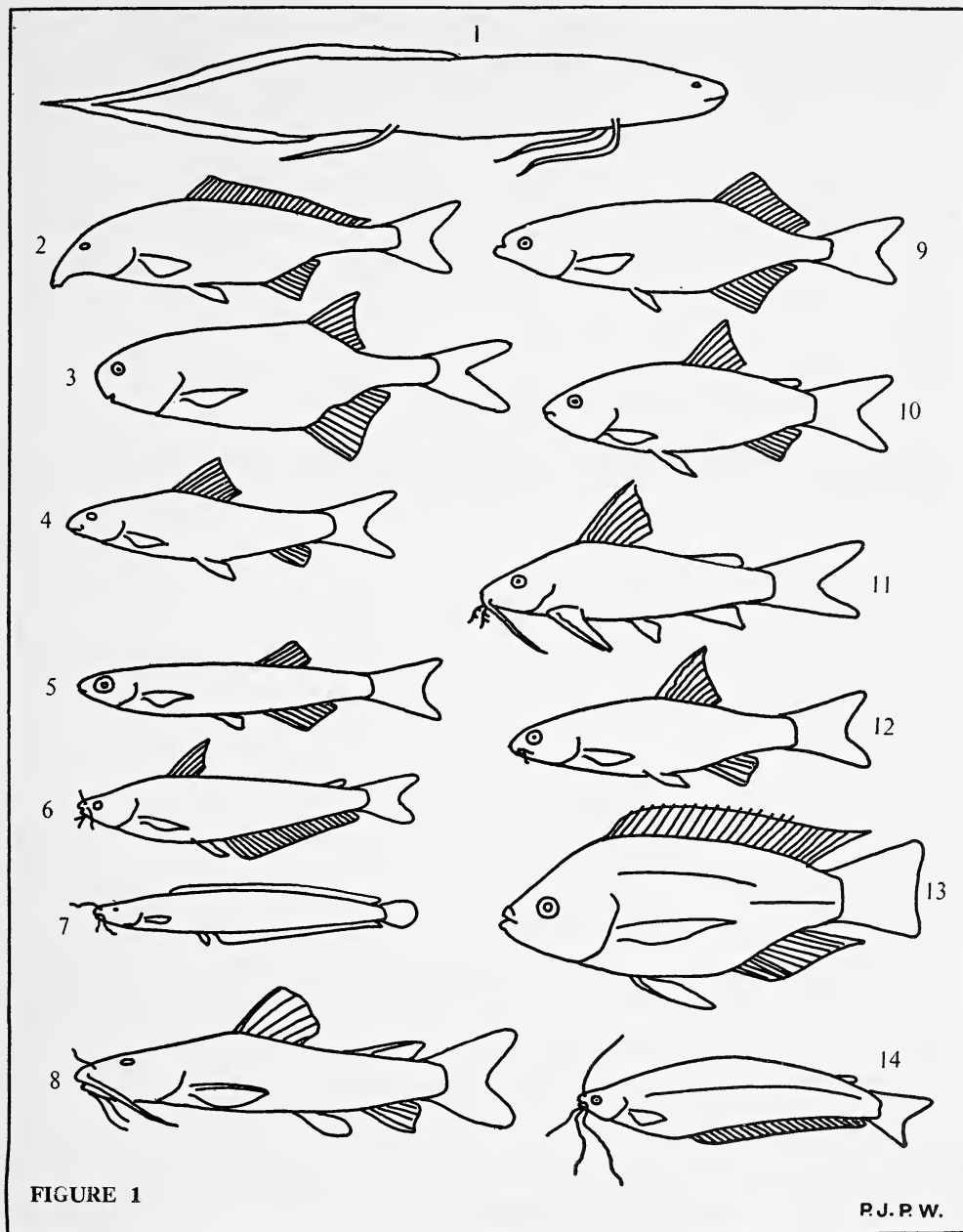
Glossogobius giuris (Ham. Buch) (all localities)

ANGUILLIDAE

Anguilla mossambica Peters

Anguilla nebulosa labiata Peters

Anguilla bicolor bicolor McClelland (probably confined to lower reaches.)



Outline drawings of the fishes found in the lower Tana River below Garissa. Approximate sizes of adults (total lengths) are indicated in brackets.

- | | | |
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| 1. <i>Protopterus amphibius</i> (attains over 100 cm.) | 6. <i>Eutropius</i> sp. (25 cm.) | 11. <i>Synodontis</i> sp. (16 cm.) |
| 2. <i>Mormyrus</i> sp. (30 cm.) | 7. <i>Clarias mossambicus</i> (up to 100 cm.) | 12. <i>Barbus zanzibaricus</i> (12 cm.) |
| 3. <i>Petrocephalus catostoma</i> (9 cm.) | 8. <i>Clarias laticeps</i> (up to 80 cm.) | 13. <i>Tilapia mossambica</i> (30 cm.) |
| 4. <i>Labeo gregorii</i> (30 cm.) | 9. <i>Gnathonemus</i> sp. (20 cm.) | 14. <i>Physalia</i> sp. (10 cm.) |
| 5. <i>Engraulicypris</i> sp. (6-8 cm.) | 10. <i>Alestes affinis</i> (14 cm.) | |

1859—SPEKE AND GRANT TRAVEL DOWN THE NILE

By MRS. D. IRWIN

When Speke was planning his second expedition to Central Africa to find the source of the Nile in 1859 he was persuaded to take a companion. He chose Colonel Grant who had been his safari companion many times in India. Grant was delighted at the idea and being something of an artist and botanist he equipped himself with paper, paints and plant presses. However, when Speke saw this paraphernalia he exclaimed that it would make too many porter loads, and, besides, was unnecessary. Grant succeeded in persuading him that some of it at any rate might be an asset, but he was only allowed one porter for all his clothes and paraphernalia.

His first collection of plants was sent back to Zanzibar from Dodoma by an Arab safari and thence to Kew. From Dodoma onwards no more plants were sent back to England, everything he collected went with him to Alexandria. One imagines he must have been allowed more porters as time went on! How anything survived the three-year journey from Dodoma to Alexandria is a marvel, but Grant was quite apologetic over specimens that did not arrive in good order, or perhaps only one leaf; however 'the gentlemen of Kew' managed to identify them all the same. The richest part of the whole journey botanically, was from the Karuma Falls (above Jinja) to Gondokora they said, but Grant adds "in consequence of ill health and the unsuitableness of the season there is a vast new field of botany under the Equator southwards."

Since at that time it was customary for plants to be named after distinguished persons it is scarcely surprising to find many of the new ones collected on this trip named after Colonel Grant.

Some of these occur in the following genera—*Maerua* (Capparidaceæ); *Hibiscus* (Malvaceæ); *Cassia* (Mimosoideæ—Leguminosæ); *Coreopsis*, *Erigeron*, *Notonia*, *Phyllactinia*, *Porphyrostemma*, *Vernonia* (all Compositæ); *Peucedanum* (Umbelliferæ); *Kniphofia* (Liliaceæ); *Ipomoea* (Convolvulaceæ); *Barleria* (Acanthaceæ); *Euphorbia* (Euphorbiaceæ); *Schizoglossum* (Asclepiadaceæ).

Few plants were named after Speke: albeit the organiser of the expedition he was a non-botanist and therefore not its important member! *Berkheya spekeana* is perhaps the one he is best remembered by.

Margaretta, an attractive asclepiad, commemorates the lady of Colonel Grant (the generic name *Grantia* being already given to a taxon in the Compositæ). It is described thus: 'corolla and fringed petal-like segments of the corona pink, *marginè eleganter dentatis*'. How richly Mrs. Grant deserved some such memento, having been without any news of her husband for three years!

Some of the descriptions in their old-fashioned language are delightful. *Sopubia karaguensis* is 'an elegant plant'; Baobabs are 'gouty limbed trees'.

PLATE III



Berkheya spekeana

PLATE IV



Margaretta rosea

NATURE NOTES

Grey Phalarope at Lake Nakuru

On the 15th February 1959 I saw two Phalarope at Lake Nakuru and on the 28th March I again saw one.

The conspicuous features were the pure white head, neck and breast except for a bold black spot round and behind the eye and a dark band extending from the crown down the nape. The back appeared a fairly uniform grey and the bill rather resembled that of a small plover, not being particularly long and fine. There would appear to be little doubt that the birds were Grey Phalarope (*Phalaropus fulicarius*).

On both occasions the birds were swimming in shallow water near the open shore and were floating high in the water, especially at the front, in marked contrast to the many Ruffs which were swimming 'down at the neck' in the deeper water.

On the second occasion the Phalarope was twirling round in the water as it swam and dabbling at the surface with its bill. It appeared that the action was bringing up small fragments of food from below the surface.

H. J. Lee, Nairobi.

An Emerald Cuckoo's Foster Parents

On the 15th September 1958 my wife and I noticed a pair of Bronze Sunbirds (*Nectarinia kilimensis*) starting to build on a low branch of a casuarina tree growing a few yards from the bungalow. It is, however, scarcely correct to say that a *pair* were building, because only the hen did the actual work on the nest. The cock fussily followed her backwards and forwards wherever she went to collect material and then sat on an adjacent branch while she worked on the nest.

She began to sit on the 21st September and on one occasion during her absence from the nest I reached up and felt one egg, but did not remove it to look at it.

On the 23rd October we saw her feeding a young cuckoo sufficiently fledged to have left the nest. Now the cock bird did his bit and was as active as his mate in trying to satisfy the insatiable appetite of the chick.

After a few days we had no difficulty in identifying a young hen Emerald Cuckoo (*Chrysococcys cypraus*). The feeding continued for 26 days, the last day they were all seen together being the 17th November. During all this time the young cuckoo was flying about vigorously from tree to tree in the garden and on several occasions we saw her being chased off by weaver birds and bulbuls.

After two days, that is on the 19th November, we noticed the sunbirds, presumably the same pair, starting a new nest in the same tree, but on a branch higher up. On the 29th November the hen was sitting. On the 2nd January 1959 what was my wife's surprise to see another young cuckoo perched on the top of the nest. This chick was subsequently identified as a hen Emerald Cuckoo. Again there was great activity in appeasing a voracious appetite. The last occasion on which the young bird was seen or heard was the 22nd January.

I may mention that we have only heard an Emerald Cuckoo calling once during the last few months (dry weather) and that was on the 6th November, the call coming from the nearby forest.

V. W. Ryves, Subukia.

A Lucky Escape for a Swift

On the 8th February 1959 at Hell's Gate Gorge, Naivasha, I saw a swift owe its life to a conflict between two rival predators—a falcon and an eagle. On the evening in question swifts in great companies were dashing round the cliffs, the wings of the approaching birds making a noise like the onset of a sudden rain-shower. Below the cliff I noted a brown eagle perching on a tree. Suddenly a falcon appeared, flying in with a swift struggling in its claws and landed not far away, then started to call anxiously—why, I could not imagine until I saw the eagle had taken flight and was in pursuit!

The falcon took off, still clinging to its swift but with laboured flight on account of the burden, and the eagle overtook it easily. So the falcon, in order to escape, had to drop the swift. The eagle, ignoring the falcon, dived for the swift, which it no doubt expected to be disabled as a result of the falcon's handling. This turned out to be wrong, however, since the swift managed to fly after all—groggily at first, when it was nearly caught; then, gaining power, it suddenly shot off triumphantly into the sky, leaving both eagle and falcon thwarted and supper-less!

The eagle resembled a Tawny (*A. rapax*), but had a conspicuous white rump and two parallel bars of white along the wing, so may well have been a Greater Spotted Eagle (*A. clanga*) as recently recorded by Mr. D. K. Bednall (see J.E.A.N.H.S., 1959, No. 100 p. 144).

The Tawny is celebrated for its habit of pursuing wounded birds and the same may well apply to the present species and does indeed apply to its smaller relation *A. pomarina*, since one of these made off with a swift shot by Meinertzhagen (see his fine new book *Pirates and Predators*, 1959, p. 118).

The falcon was either a Peregrine or a Lanner (*F. peregrinus* or *biarmicus*)—I failed to get a good view of the crown to see which. The swift looked like a Common Swift (*A. apus*), being small and dark and with a strongly-forked tail.

Mr. and Mrs. Anthony Ravenscroft of Nairobi and Mr. Gordon Ravenscroft from England were with me when this dramatic episode took place.

Myles E. W. North, Nairobi.

A Migration of Lesser Kestrels

On the 31st March a memorable migration of Lesser Kestrels (*Falco neumannii*) started to pass over the Nairobi area.

On the first evening some 4,500 birds passed between 16.30 hours and 19.45. On each subsequent evening, during about the same hours, further large numbers of Kestrels passed but not in such large numbers as on the first day. The movement continued until the 8th April after which no more Lesser Kestrels were seen.

The flight was slow but steady, much use evidently being made of up-currents and sometimes anything up to a hundred were circling in a single up-current with hardly a flap of the wings. The birds were not in compact flocks but were somewhat scattered both in a vertical and horizontal plane, the lowest flying below the treetops whilst the highest could be seen only with binoculars. During these ten days no Lesser Kestrels were seen except during the late afternoon.

From the point of observation, which was on the ridge near Gymkhana Road overlooking the Athi Plains, the birds came from the Langata direction and disappeared on a general north-east bearing.

D. K. Bednall, Nairobi.

Migrant Records—January to May 1959

The following were the last dates of occurrence extracted from data sent in by members.

<i>Species</i>	<i>Locality</i>	<i>Date</i>	<i>Notes</i>	
Hobby (<i>Falco subbuteo</i>)	Nairobi	15/5	small flock	DKB
Golden Oriole (<i>Oriolus oriolus</i>)	Mua Hills	10/5	many	EB & JGW
Swallow (<i>Hirundo rustica</i>)	Nairobi	12/5	flocks	DKB
Black tailed Godwit (<i>Limosa limosa</i>)	Elmenteita	3/4	1 ad.	JGW
Little Tern (<i>Sterna albifrons</i>)	Naivasha	17/5	1 collected	JGW
Reeve (<i>Philomachus pugnax</i>)	„	2/4	no ruffs	JGW
Spotted Redshank (<i>Tringa erythropus</i>)	„	2/4	single bird	JGW
Gull-billed Tern (<i>Gelochelidon nilotica</i>)	„	2/4	full b.d.	JGW
Sedge Warbler (<i>Acrocephalus schonobæus</i>)	„	2/4	in reeds	JGW
Whitethroat (<i>Sylvia communis</i>)	„	17/5	pair	EB & DKB
Willow Warbler (<i>Phylloscopus trochilus</i>)	Kilifi	12/4	abundant	JGW
Garganey (<i>Anas querquedula</i>)	Naivasha	2/4	few	JGW
Black Kite (<i>Milvus migrans</i>)	„	2/4	several	JGW
Marsh Harrier (<i>Circus aeruginosus</i>)	„	2/4	loose migration	JGW
Pale Harrier (<i>Circus macrourus</i>)	„	2/4	„	JGW
Montague's Harrier (<i>Circus pygargus</i>)	„	2/4	„	JGW
House Martin (<i>Delichon urbica</i>)	Elmenteita	5/4	several	JGW
Sand Martin (<i>Riparia riparia</i>)	Naivasha	27/4	„	DKB
Marsh Sandpiper (<i>Tringa stagnatilis</i>)	„	17/5	several	DKB
Greenshank (<i>Tringa nebularia</i>)	„	17/5	two	DKB
Barred Warbler (<i>Sylvia nisoria</i>)	Kibwezi	10/4	single bird	JGW
Nightjar (<i>Caprimulgus europæus</i>)	Lukenia	20/4	„	EANHS
Great Reed Warbler (<i>Acrocephalus arundinaceus</i>)	Kilifi	11/4	„	JGW

European Roller (<i>Coracias garrulus</i>)	Naivasha	20/4	„	DKB
Rock Thrush (<i>Monticola saxatilis</i>)	Nairobi	18/4	full b.d.	DKB
Ringed Plover (<i>Charadrius hiaticula</i>)	Kilifi	30/4		JGW

Mongolian Sand-plover (*C. mongolus*); Great Sand-plover (*C. leschenaultii*); Sanderling (*Crocethia alba*); Turnstone (*Arenaria interpres*); Whimbrel (*Numenius phaeopus*) ... all at Kilifi 30/4.

Curlew Sandpiper (<i>Calidris testacea</i>)	Ol Bolossat	24/5	three, part b.d.	DKB
Spotted Flycatcher (<i>Muscicapa striata</i>)	Nairobi	26/4	pale coloured	DKB
Red-backed Shrike (<i>Lanius collurio</i>)	„	5/5	single ♂	DKB
Honey Buzzard (<i>Pernis apivorus</i>)	Mtito Andei	11/4	single bird	JGW
Marsh Warbler (<i>Acrocephalus palustris</i>)	Kilifi	16/4	—	JGW
Nightingale (<i>Luscinia megarhynchos</i>)	„	15/4	pale bird	JGW
Terek Sandpiper (<i>Xenus cinercus</i>)	Mida Creek	22/4	full b.d.	JGW
Caspian Tern (<i>Hydroprogne caspia</i>)	Kilifi	24/4	few	JGW
Lesser Kestrel (<i>Falco naumanni</i>)	Nairobi	8/4	c. 10,000	DKB
Red-footed Falcon (<i>Falco amurensis</i>)	Kilifi	24/4	ad. ♂ collected	JGW
Lesser Grey Shrike (<i>Lanius minor</i>)	Kibwezi	10/4	common	JGW
Yellow Wagtail (<i>Budytes lutens</i>)	Naivasha	17/5	single bird	DKB
Black-headed Yellow Wagtail (<i>Budytes feldegg</i>)	„	2/4	—	JGW
Dark-headed Yellow Wagtail (<i>Budytes thunbergi</i>)	Ol Joro Orok	25/4	several	DKB
Blue-headed Yellow Wagtail (<i>Budytes flavus</i>)	Naivasha	2/4	—	JGW

Although for the current half-year we have improved over the last in the volume of migrant records, a much greater coverage is needed before we can be satisfied that we are getting a true picture of the migration pattern. Please send all records to the Secretary.

D. K. Bednall, Nairobi.

Rain-making

It would be interesting to learn whether anyone has witnessed the same phenomenon as Major Goodwin and the writer last August.

Travelling over an area of some 20 square miles, which was being burnt off, it was noticeable that dense cloud gathered throughout the day. This was first white, later becoming very dark. No ground breeze was evident, nor could there have been any at height, for the cloud remained static.

Soon after 5 p.m. what appeared to be two or three storms developed, only above this area. We estimated that as much as two inches of rain must have fallen in the centre of the storms. Being in a position to see for several miles, there was no question of these drifting in from the higher ground, nor did they pass on, but petered out in a little under two hours.

In view of experiments carried out in other parts of the world with carbon black, it appears feasible that conditions were such on the day we saw this happen, that a state of combined favourable conditions existed to enable this to be brought about (such as moist air and no wind).

It is not my intention to suggest the starting of wholesale fires, but to draw attention to what has been observed.

David Hobden, Mines and Geological Department, Nairobi.

Mammals after Rain

During April Mr. J. B. Sale and myself visited the Nairobi Game Park. Our visit coincided with a storm, which gave an opportunity of observing the behaviour of several mammals after rain.

The large numbers of antelopes seen appeared to be very restless, moving most of the time with very few of them grazing. No doubt scent at this time is somewhat impeded and the danger from carnivores is greater.

Passing on towards Lone Tree we came across a pride of lions. The pride consisted of four females and one male. Although it was only 4.30 p.m. they were all very active, making mock charges at one another, and roaring frequently. During this time the male charged our vehicle twice. After some time two females approached a tree and began to climb it. They reached a branch some 10-15 feet from the ground and appeared to scan the horizon. It has since occurred to me that scent may be better at this level just after a rain shower. After about half an hour both lionesses descended the tree, completing their descent with a leap of some five feet from a low branch. Soon afterwards the lion and two lionesses wandered off.

The study of large mammals under varying weather conditions could be, as one can see from these observations, a very rewarding one. Particularly with a fairly complete photographic record to accompany such observations.

M. J. Coe, Nairobi.

LETTERS TO THE EDITOR

Dear Madam,

Lake Migration of Hobbies

On the 1st May 1959 a flock of 25 to 30 Hobbies (*Falco subbuteo*) passed through Nairobi. They were flying quite slowly and their rufous thighs betrayed their identity.

Van Someren (E.A.N.H.S. Journal Supplement 1931) quotes the first week in April as the last recorded migration date for these birds in the Nairobi area.

A few days later (7th May) a further small flock flew over Nairobi. All the birds were moving in a generally north-easterly direction when in the vicinity of Nairobi.

Yours, etc.

D. K. BEDNALL,
Nairobi.

Dear Madam,

Drumming of Swifts

In the June 1958 issue of the Journal I recorded 'drumming' by the Mottled Swift (*Apus aequatorialis*). Mr. S. H. Wood of Langata has now reported this also from the Langata area.

It would be interesting to learn if any members have heard this species of swift 'drumming' elsewhere in East Africa—or is it a peculiarity confined to the flock which frequents Langata?

Yours, etc.

D. K. BEDNALL,
Nairobi.

Dear Madam,

Scorpion Shells

I read with interest Dr. Verdcourt's Note on scorpion shells in your January issue. So far as Tanganyika is concerned, I think *Lambis scorpio* is to be added to the list. I have not yet found a live specimen, but I have found a shell in good condition at Oyster Bay, Dar es Salaam. I have not seen any specimen of *Lambis pseudoscorpio* or *Lambis violacea*, alive or dead, from the Dar es Salaam area.

I have recently seen a specimen of *Lambis lambis* found alive at Mombasa by Mr. A. F. V. Jenkins, which has one arm more than usual. In all other respects it is a normal specimen and shows no sign of injury. I have seen nothing like it before.

Yours, etc.

J. F. SPRY,
Dar es Salaam.

ACTIVITIES OF THE SOCIETY IN NAIROBI January to June 1959

During the first half of 1959 the main activities of the Society were centred on weekend excursions, two of which were camping weekends, and there were also film shows and lectures.

There were three full-day rambles and the first, arranged by Mr. Roy Bowles, took members from Nairobi and Nakuru to the Kedong Valley in January. There was also a film show during the same month, ably arranged by Mr. S. J. K. Collins in the Museum, when colour transparencies of members' game pictures were shown, together with some very fine slides of English sea-birds, which were kindly lent by Mr. Simpson of the East African Railways and Harbours.

A weekend camp on a farm at Ol Joro Orok was held in February through the kind permission of Mr. C. E. Corbett. Members camped on the outskirts of a natural cedar forest and heard and saw many interesting forest birds. Two visits were arranged to nearby Lake Ol Bolossat, through the courtesy of Mr. Madsen, and members were able to study a wide number of species of wild-fowl and water-birds and recorded a pair of European widgeon in addition to several other migrants. Perhaps the most memorable impressions were the large numbers of Kavirondo Cranes and the beautiful 'butterfly' flight of the male Delamere's Widow-birds, which were numerous among the reeds by the lake; the males were in full breeding plumage in marked contrast to the sparrow females.

There was another most enjoyable film show in the Museum in February, when Mr. Leslie Brown showed us the excellent films describing his investigations of flamingo colonies in East Africa.

In March a group of bird-watchers, under the experienced leadership of Mr. Myles North, visited the Crescent Island Bird Sanctuary, Lake Naivasha, and then went on to Hell's Gate Gorge.

A further visit was made to Lukenia and a nearby farm during April, permission being kindly granted by the respective owners—Miss Irvine and Mr. Wakeford. Some 87 species of birds were recorded, including a male European Nightjar, which exposed itself on a bare branch, all members thereby obtaining a detailed view. A single Verreaux's Eagle, White-necked Ravens and a Lanner were among the interesting birds of prey seen.

The Annual General Meeting was held at the Norfolk Hotel, Nairobi on the 1st April, and was followed by the showing of two films—one on wild life and the other on insects.

Members spent the long Empire Day weekend (23rd/25th May) camping at Bushwhackers, Mr. and Mrs. Stanton's safari camp—a weekend which was organised by Mr. Malcolm Coe. We were extremely grateful to the Stantons for their kindness in putting the whole camp at our disposal for this weekend.

Also deserving of our thanks is Mr. Reucassel from South Africa who, at the beginning of June, at the Royal Technical College, showed us his film which won the Silver Medal in the Italian Sports Film Festival. The film showed the extraordinary way in which Cape Vultures will follow gliders and was much enjoyed by members.

At the beginning of June, too, Mr. Malcolm Coe lectured on some 'Aspects of the Biology of Mount Kenya' and showed some excellent coloured slides of the high alpine flora and fauna collected during his recent trip to the mountain.

Perhaps it would not be inappropriate here to mention how much we miss 'Buster' and Betty Collins, who were always very active insofar as rambles were concerned and, who, when they left Nairobi for Dar es Salaam, left a gap not easy to fill.

BOOK REVIEWS

Trees of Central Africa

Paintings by Olive Coates-Palgrave

National Publications Trust, Salisbury, S.R., 1956. Obtainable from most booksellers, price Shs. 94/-.

This magnificent and lavishly illustrated book is of a style too rarely seen nowadays, and for which the authors were fortunate in having the financial support of the National Publications Trust of Rhodesia and Nyasaland (an organisation which we in East Africa would do well to emulate). This volume deals with 110 of the commoner trees of Rhodesia and Nyasaland, the majority of which also occur in East Africa. Besides providing descriptions, the text gives vernacular names, uses of all parts of the trees, and comments of both an informative and entertaining nature.

The paintings are in the main after the style of the 18th-century flower-painters. Their clarity and the excellent characterisation of leaf and flower have been well preserved in the high quality reproductions. The series of habit/habitat photographs by the artist's sons supplement and complement the paintings delightfully.

So many trees have of necessity been excluded in an area with an enormously rich flora that this book is for the collector rather than a practical guide to Central African trees.

Diana Napper

Early Man in East Africa

By Sonia Cole

102 pp. 20 fig. 1958. Price Shs. 5/-.

This little volume is really intended for use in schools in order to give students of history a background to the pre-history which leads up to it. In effect, the book summarises information which was set out in the author's larger work which was published by Penguin Books, and indeed, most of the illustrations of the present work appeared in the Penguin book. The impression most not, however, be gained

that this is simply an abridged edition of the Penguin book. It is not. It is a completely rewritten account prepared for a different public, and also contains some new information which had not come to light at the time of the earlier book.

One of the difficulties of attempting to summarise the story of a million years into one hundred pages is that there is bound to be over-simplification and the use of generalisation, which can be wholly misleading. Such simplifications occur throughout the book, and a few of them will be noted here, at the same time it must be clearly realised that they do not detract from the value of this present book as a general introduction to the story of East Africa's past.

One generalisation that does, however, need to be rectified is the suggestion that the Stillbay culture is closely linked with dry bush country. This is emphatically not the case, although it is true about many of the Stillbay sites, but not by any means all of them are in country that can be *today* described as dry bush country; but, as Sonia Cole herself makes clear, the Stillbay culture belongs to a pluvial period, and the climate at the time when this culture flourished was very considerably wetter than today, and what is now dry bush country was not dry bush country then.

An example of the dangers of over-simplification is to be found in the paragraph on page 14, in which it is stated 'sometimes it is hard to tell from the appearance of a fossil skull whether it belonged to an ape or a man, but when stone tools are found with the bones, it is then certain that the being was a true man.' It is, of course, true (as Mrs. Cole has clearly stated elsewhere in the book), that the modern definition of the word 'man' in a prehistoric context, means a 'tool-maker', but the mere association of higher primate bones with stone tools does not, of necessity, mean that the bones represent the makers of these tools. It is just as possible that the tools were made by some other primate who was a true man, and that the bones found with them represent a different type of primate (who may not have yet reached man status), and who was killed and eaten by true man.

Another example is to be found on page 15, where we are told that man discovered that by hitting one rock against another, it was possible to make tools with sharp edges. With these useful weapons, she says 'he could kill a wounded animal far more easily than by using his teeth, and he could also skin it, which again saved using the teeth and nails.' A little further on we read 'By cutting the meat into small pieces, he saves the work of his jaws.' These statements represent such extreme simplification that the whole significance of the fact of pre-man becoming an early tool-maker, and thus man, is lost. The real position, as I see it, is that the 'near man' who preceded man, had neither the right kind of teeth nor the right kind of claws on his fingers or toes to enable him either to kill or to skin or to cut off the meat from those kinds of animals which serve as the main source of meat supply for the larger carnivorous animals. It was only, therefore, when the pre-human who lacked long, sharp, canine

teeth or strong, lion-like claws, at last discovered how to make a sharp edge on a piece of stone, that he opened up for himself and his family a completely new field of food supply. The first tools which he made of stone were not weapons to kill a wounded animal more easily than by using his teeth. They were not weapons at all, they were domestic tools. With such tools he could begin to do things that he had not been able to do even badly before. He was thus not saving his teeth and nails, or saving his jaws, but rather using something that supplemented his natural equipment which was adapted to a vegetarian and insectivorous, and probably small mammal diet.

Sonia Cole's little book will surely make a lot of people want to read other books dealing with man's past, such as her Penguin book and books by other authors. It should be of the greatest value to school-children and others, and open a new field of thought.

L. S. B. Leakey

Hoopoe Feeds Honeyguide

At the back of the garden of Government Lodge and the prison in Arusha runs an old winding road down to the German-built boma. Tall trees such as *Grevillea robusta* and indigenous figs border the road and the adjoining gardens. The road is much used by pedestrians and when walking there one morning (29.12.58) I watched with delight a Hoopoe (South African, *Upupa africana*, I thought) feeding a young bird sitting on a scar on the trunk of a *Grevillea* tree about 23 feet up. The Hoopoe fed it about five times in 15 minutes, clinging to the trunk below the bird to do so.

The young bird, which from the description has been identified by Mr. Williams as a Greater Honeyguide (*Indicator indicator*), was fully feathered and seemed large, about eight inches long, the head, nape, back, wings and tail appeared dull green, with golden-yellow throat, chest and breast; under tail coverts and middle lower back were whitish, and the leading edge of the wing was yellow; the beak was thick and round and the eyelid was a white rim.

The bird moved about the scar and appeared ready to fly, and though I returned ten minutes after leaving the place, and again the next day and the day after, I never saw it again, though a Hoopoe was near next day.

The site is about 4,500 feet above sea level; and 300 yards from the Boma; the *Grevillea* is not very large, having a girth of 40 inches at a height of six feet from the ground. There is a hole at the base of the scar invisible from below. This proved on investigation three months later, to be over a foot in depth and at that time, contained no nesting material.

Mrs. N. Probyn.

OBITUARY

HUGH COPLEY

It is with deep regret that the Society has to record the death in England on the 16th May, after a long illness, of a former President, Mr. Hugh Copley, O.B.E.

Mr. Copley, who had been Fishwarden (later Chief Fishery Officer) of Kenya Colony from 1937 to 1955 when he was invalided home, had been an active member of the Society for nearly 30 years, and had served in turn as a Committee Member, Secretary and President, in addition to being the Society's representative on the Museum Board of Trustees for a number of years. During the difficult war years, when so many other bodies had to close down for lack of support, Mr. Copley played a notable part in keeping the Society's activities going, and the present healthy state of the Society owes a great deal to the energetic support which Mr. Copley always gave to its affairs.

An acknowledged expert on the marine and freshwater fishes of Africa, he was a regular contributor to the Journal on this subject; but in addition to this, his natural history interests and enthusiasm were very wide, and his popular writings on sea-shore life, small mammals, fossils and prehistory of Kenya for example have guided the interests of members into these very different channels for many years. The Coryndon Memorial Museum—the child of this Society—also owes much to Mr. Copley's untiring activities in support, and the present Fish and Invertebrate Gallery stands as a testimony to his skill and knowledge in an entirely voluntary capacity.

As a person, to those who sought his advice, he was at all times courteous and helpful; and to those who were privileged to know him as a friend he will long be remembered for his kindness, generosity and hospitality. By his passing, Kenya has lost another of its colourful personalities, and the Society a true naturalist in the finest old-fashioned meaning of the word.

To his widow, Mrs. Gwen Copley, formerly well-known in Kenya horticultural circles and also for several years Hon. Librarian of the Society, we extend our deepest sympathy in her loss.

V.D. v S.

EAST AFRICA NATURAL HISTORY SOCIETY

Notice to Contributors

Contributions. The Committee is pleased to consider contributions on natural history for publication in the Journal on the understanding that these are not also being offered, wholly or partially, to any other journal. They should be addressed to the Secretary, P.O. Box 658, Nairobi.

Typescript. Articles should be typed on one side of the paper, in double spacing and with wide margins.

Illustrations. These should be in a form suitable for reproduction. The Editor cannot be expected to re-draw. Line drawings should be in Indian ink on Bristol board or thick white paper. Reproduction will be better if they are drawn larger than it is intended that they should appear. An indication of the degree of reduction is advisable. Photographs should be printed on glossy paper and a better reproduction is achieved from prints slightly darker in tone than normal.

Nomenclature. Where a recent standard work for the area is available (e.g. Praed and Grant for birds) the names given there (both English and scientific) should be used. Initial capitals should be used for specific English names, e.g. Pied Wagtail and small initial letters for group names, e.g. wagtails. Scientific names must be underlined. Where an English name is used, it is normally advisable, on first mention, to add the scientific name to avoid misunderstanding.

References. These are usually abbreviated in the text and listed more fully in alphabetical order of authors at the end of the article. For example, in the text a book reference might be (Jackson 1938: I p. 24); a periodical reference might be (Pinhey 1956: p. 20). At the end of the contribution: Jackson, F. J., 1938. *Birds of Kenya and Uganda*. Pinhey, E. C. G., 1956. *The Emperor Moths of Eastern Africa*. Journ. E.A. Nat. Hist. Soc. XXIII No. 1 (98). With short articles it may not be worth making a list of references at the end, but the whole reference in the most abbreviated comprehensible form should then be inserted in the text.

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